	U. S. DEPARTMENT OF THE INTERIOR OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT DIRECTIVES SYSTEM	Subject Number: AML-1 Transmittal Number: 367 Date: 8/25/87

Subject: AML Inventory Update Manual

Approval:  **Title:** Acting DIRECTOR

1. Purpose. This directive incorporates the AML Inventory update manual which provides guidance and delineates responsibilities for maintaining the National Abandoned Mine Land (AML) Inventory.

2. Definitions and Abbreviations.

a. Keywords used in the AML Inventory Update Form. Keywords utilized in defining health, safety and general welfare problems are provided in Appendix E of the AML Inventory Update Manual which is attached. Keywords utilized in defining land and water problems are provided in Appendix F of the AML Inventory Update Manual.

b. E/WFO means OSMRE Eastern/Western Field Operations offices.

c. FO means OSMRE Field Office

d. AML means Abandoned Mine Lands.

3. Policy/Procedures. The National AML Inventory data base includes:

a. General information about every Problem Area submitted by a State/Tribe.

b. A description of all problems (Priority 1, 2, 3) that occur in every Problem Area submitted by a State/Tribe.

c. An estimate of the construction cost to reclaim all problems identified in each Problem Area by AML priority.

The attached AML Inventory Update Manual sets forth procedures for collecting and evaluating the information required to update the National AML Inventory. It is designed to assist each State/Tribe, OSMRE Field Office and the E/WFO in completing the AML update. Work plans and schedules will be issued each fiscal year by the Technical Support Branch of the AML Division, Headquarters to E/WFO to execute policies and procedures contained in the manual.

The Technical Support Branch of the Headquarters Abandoned Mine Lands Division is responsiole for administering the National AML Inventory process, maintaining and updating the AML Inventory Update Manual, and maintaining the AML Inventory Update Database.

4. Reporting Requirements. All reporting requirements are outlined on page 5 of the AML Inventory Update Manual (attached).

5. References. None

6. Effect on Other Documents. The attached AML Inventory Update Manual incorporates the policy statement on "Public Concern in Inventory Update" issued by the Assistant Director for Program Operations and Inspection on October 4, 1984.

7. Effective Date. Upon issuance.

8. Contact. Division of AML (343-3366), Technical Support Branch, Office of Surface Mining Reclamation and Enforcement.

FINAL

AML INVENTORY UPDATE MANUAL

Prepared by the

OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT
U.S. DEPARTMENT OF THE INTERIOR

Purpose

This manual is designed to assist each State/Tribe, OSMRE Field Offices and the two OSMRE Field Operations in completing the AML Update Form. This will be accomplished by discussing each line of the form and supplementing these instructions with definitions and additional material in the Appendices.

JANUARY 1987

Note: The August 1984 AML Inventory Update Manual is herein revised to accommodate a single revision - the inclusion of the policy statement "Public Concern in Inventory Update," issued by the Assistant Director for Program Operations and Inspections on October 4, 1984.

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INTRODUCTION

The Abandoned Mine Lands (AML) Inventory was authorized by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information to meet the objectives of Title IV, Abandoned Mine Reclamation, of Public Law (PL) 95-87--the Surface Mining Control and Reclamation Act of 1977. The major objective of this Inventory was to help OSMRE and participating States or Indian Tribes to locate and identify AML problems and estimate their reclamation costs. This Inventory concentrated on the most serious problems. "Serious" means problems that are adversely affecting the public health, safety, and general welfare (HS&GW).

The Inventory included 35 States and 4 Indian Tribes, with approximately half assuming the responsibility to conduct the fieldwork and the other half accomplished through OSMRE Headquarters' contracts. The result was that 28 States, their contractors, or OSMRE contractors conducted the Inventory fieldwork and recorded and submitted the data. OSMRE's prime contractors--Oak Ridge National Laboratory and the Tennessee Valley Authority--along with East Tennessee State University and Lockheed Corporation, conducted all the training for these data collectors, received and reviewed all submitted data, and coded and entered the data in the AML Inventory data base. The result is a National Inventory of AML Problems.

Although the AML Inventory is problem-oriented, many areas were surveyed but not submitted because no problems existed or only Priority 3 problems (Lands or Waters) were present. In the future, the Inventory will also be used as an accounting tool. If questions are asked about the status of a problem that was surveyed but not entered in the data base, there is no means for anyone to respond. Experience has shown that when new HS&GW problems occur or are discovered, they are usually associated with existing Problem Areas. This update also allows for the submittal of Problem Areas with only Priority 3 problems. These voluntary updates will be entered in the database for future reference. Then, if the status of a particular location is questioned and the area's presence in the Inventory is documented, OSMRE and the State/Tribe will immediately know it has been surveyed and the record will show any problems that may exist.

The result and product of this Update will be a data base that shall be called the Update Database. It will include:

1. General information about every Problem Area submitted by a State/Tribe.

2. A description of all problems (Priority 1, 2, 3) that occur in every Problem Area submitted by a State/Tribe.

3. An estimate of the cost to reclaim all problems identified in each Problem Area by AML priority.

Objective of the Update

To provide each State/Tribe, OSMRE E/W Field Operations, OSMRE Field Offices, and OSMRE Headquarters with an accurate picture of what AML Priority 1 and 2 problems and associated Priority 3 problems, in need of reclamation, exist in the field at any point in time.

AML UPDATE FORM

Submission of an Update Form

When to Submit an Update Form

1. For every new Priority 1 and 2 Problem Area included in an Annual Submission of Projects. Priority 3 problems should also be described at these new Problem Areas.

2. For every Problem Area included in the Construction Grant Application (CGA) (this need is waived if the Inventory information is the same as the previous Update). This CGA Problem Area Update requirement also allows for the infrequent occurrence when reclamation funding is requested but the Problem Area had not been previously identified in an Annual Submission of Projects.

3. For every HS&GW Problem Area included in completed projects (including Federal Projects). This update requirement will identify all problems that still exist and need to be reclaimed after the project is complete. The appropriate time for this update is when the State/Tribe submits the final report on the Construction Grant.

4. At any time States/Tribes or the Eastern/Western Field Operations wish to describe changes in conditions within a Problem Area.

5. At anytime States/Tribes or the Eastern/Western Field Operations make a significant change to cost estimates for a problem.

6. The Eastern and Western Field Offices will be responsible for (a) updating all existing Problem Areas in nonprimacy States/Tribes, (b) creating new Problem Areas in nonprimacy States/Tribes, and (c) updating any existing Problem Area in reclamation projects they administer, both emergency and nonemergency. If any reclamation project administered by the Eastern/Western Field Offices involves a situation not previously included in a Problem Area it will not be necessary to create one unless other problems still remain. (However, each State/Tribe may voluntarily create a new Problem Area to show that the problem existed but has been reclaimed.)

7. The Field Office (FO), in cooperation with the Soil Conservation Service (SCS) and each State/Tribe, will be responsible for ensuring that all existing Problem Areas in RAMP projects are updated. Each FO should make this request to the responsible SCS office and be prepared to assist them in the process. If a RAMP project addresses a problem not previously included in a Problem Area the creation of a new Problem Area is not required but may be done voluntarily, at the option of the State/Tribe to note that the problem existed but has been reclaimed.

Validation

Each State/Tribe and the Eastern/Western Field Offices will submit either mandatory or voluntary Problem Area Updates to OSMRE Field Offices. This directive describes the type of update information needed. The OSMRE Field Offices validate these submittals for completeness and quality of information--State/Tribe validation. As a further check to be sure this Field Office evaluation is being conducted consistently nationwide, OSMRE will also review these Field Office evaluations--Field Office Oversight. (See Appendix A)

The Update Database

A new database has been designed so that information can be easily entered as it is received and accessed as needed. This new database is called the Update Database and currently includes all information from the National AML Inventory in its standardized form. Each State/Tribe, the Field Offices, and the E/W Field Operations have these data for each Problem Area under their responsibility and they will receive updated versions in the future.

It is very important to note that each Update of an existing Problem Area will replace the current record in the Update Database. This means that each problem identification and reclamation method and estimated costs must stand on its own just as if you were identifying problems and describing reclamation in a new Problem Area. This would normally mean you would need to repeat all problem justifications on the Update. To avoid this duplication of effort use the following procedure. If any problem (Priority 1, 2, or 3) is present in the standardized data and still existed when the Problem Area was updated note the presence of the problem in the appropriate question. In the narrative repeat the keyword(s) abbreviation(s) and write immediately following, "this was justified in the standardized data." You may wish to increase or decrease the extent of the problem due to more accurrate information. This does not change the problem status but may change the reclamation cost. If this is the case again write the above statement and follow it with any changes.

Example: the original data identified a Portal HS&GW problem involving two portals but this was not included in the National AML Inventory. The Update indicates there is a portal problem. You will need to justify this problem status in the narrative. If the National AML Inventory includes this portal problem you would write in the narrative; "P - this was justified in the standardized data." If the portal problem included four instead of two portals you would write in the narrative " P - this was justified in the standardized data but more recent information indicates the number of portals is four instead of two."

If it is the first Update of an existing Problem Area the reclamation method and cost estimates must be updated. This is because actual estimates by problem priority are being recorded in the database rather than a cost category for the entire Problem Area.

Filling Out the AML Update Form

Please be sure to answer every question, by completing the blank, writing Y (yes) or N (no), or occasionally checking the appropriate answer. If no response is needed, indicate by writing "NA" (nonapplicable), "none," or some other appropriate response to indicate the question was considered and not just overlooked.

DEPARTMENT OF THE INTERIOR
Office of Surface Mining
ABANDONED MINE LANDS INVENTORY UPDATE FORM

A. GENERAL AND LOCATIONAL DATA

1. Date Prepared: ___/___/___ 2. Prepared by _____

3. State/Tribe Name: _____ 4. Telephone Number_____

5. Problem Area (PA) No. _____ 6. PA Name_____

7. _____ (Y/N) This PA has been previously submitted and is included in the National AML Inventory (If YES, skip to Part B).

8. Planning Unit (PU) No. _____ 9. PU Name:_____

10. County _____ 11. FIPS CODE (five digit)_____

12. _____ Congressional District Number

13. _____ 8-Digit Water Cataloging Unit (WCU) No. in which PA is located.

14. USGS Quadrangle(s) _____ _____
Principal Quad Secondary Quad

_____
Other Quad(s)

15. _____ Map Series (Enter 7.5', 15', or other basis)

16. _____ Map Sector (Enter NW, NC, NE, WC, CS, EC, SW, SC, or SE)

17. Principal Quadrangle Coordinates (found on SE map corner)
N _____ W _____

18. This PA is located _____ Miles _____
Distance Direction

_____
From (City, Town, Village, Highway, or other prominent feature on map)

19. _____ (S/U/B/P) Type of last coal mining?
(S)Surface (U)Underground (B)Surf/Undgrd (P)Coal Processing

B. REASONS FOR UPDATE

20. _____ Enter a letter and an applicable number.

A. Annual Submission of Projects. New Problem Area.

B. Construction Grant Application.
1. New Problem Area
2. New cost estimates
3. Existing Problem Area - new or more serious problems

C. Completion Report.
____ 1. State Reclamation ____ 2. Emergency
____ 3. Federal Reclamation ____ 4. RAMP

D. New Problem Area

E. New or more serious problem(s) at existing Problem Area.

F. Site visit indicates no problem changes.

AML INVENTORY UPDATE FORM (Continued)

C. DESCRIPTION OF HEALTH, SAFETY, AND GENERAL WELFARE PROBLEMS (HS&GW)
Priority 1 and 2 Problems (Check the space if the keyword is present)

21.	Extreme Danger Problems	Other HS&GW Problems		Extreme Danger Problems	Other HS&GW Problems
	Priority 1	Priority 2		Priority 1	Priority 2
VO	_____	_____	PWAI	_____	_____
P	_____	_____	PWHC	_____	_____
SB	_____	_____	S	_____	_____
GUB	_____	_____	HEF	_____	_____
GHE	_____	_____	IRW	_____	_____
DPE	_____	_____	HWB	_____	_____
DI	_____	_____	DH	_____	_____
DS	_____	_____	CS	_____	_____
			N (None)	_____	_____

D. PRIORITY 1 AND 2 CRITERIA

22. _____ (Y/N) Has there been any occurrences of injury or death to a person, or accident or damage to property due to HS&GW problems?
23. _____ (Y/N) Have local residents/officials been interviewed regarding HS&GW problems in this PA?
24. _____ (Y/N) Is there corroborative evidence concerning the HS&GW problems?
25. _____ (Y/N) Is there evidence of site visitation?
26. _____ (Y/N) Are the HS&GW problems in this PA easily accessible?
27. _____ (Mi.) Distance to nearest population from this PA?
28. _____ (Y/N) Is this PA visible from public use areas?
29. _____ (0-3) How many people are directly impacted by the HS&GW problems?
(0) None (1) 1-10 (2) 11-100 (3) More than 100
30. _____ (S,M,O,U) Is there local support for reclamation of the HS&GW problems?
(S) Support (M) Mixed (O) Opposition (U) Unknown

E. EVIDENCE OF HEALTH, SAFETY, AND GENERAL WELFARE PROBLEMS

31. Narrative evidence of Priority 1 problems: _____

AML INVENTORY UPDATE FORM (Continued)

32. Narrative evidence of Priority 2 problems: _____

F. ENVIRONMENTAL RESTORATION PROBLEMS (Land and Water)

	Problem Keyword		Priority 3 Problems		Problem Keyword		Priority 3 Problems	
33.	Spoil Area	(SA)	_____	acres	Mine Openings	(MO)	_____	number
	Bench	(BE)	_____	acres	Slump	(SP)	_____	acres
	Pits	(PI)	_____	acres	Highwall	(H)	_____	Len. in
	Gob	(GO)	_____	acres	Equip/Facil	(EF)	_____	number
	Slurry	(SL)	_____	acres	Ind/Res Waste	(DP)	_____	acres
	Haul Road	(HR)	_____	acres	Water Problems	(WA)	_____	Gal/min.
					Other	(O)	_____	
					NONE	(N)	_____	
	Total		_____	acres				

G. EVIDENCE OF ENVIRONMENTAL RESTORATION PROBLEMS

34. Narrative evidence of Priority 3 problems: _____

AML INVENTORY UPDATE FORM (Continued)

H. RECLAMATION COST

35. $ _____ Priority 1 (Extreme Danger Problems) estimated reclamation cost.

36. Priority 1 Cost Estimate Justification: _____

37. $ _____ Priority 2 (Other HS&GW Problems) estimated reclamation cost.

38. Priority 2 Cost Estimate Justification: _____

39. $_____ Priority 3 (Environ. Restor.) estimated reclamation cost.

40. Priority 3 Cost Estimate Justification: _____

A. General and Locational Data

1. Date Prepared. This is the date the Update Form was completed.

2. Prepared By. Name the person who completed the form.

3. Telephone Number. The telephone number at which the preparer may be reached.

4. State/Tribe name. Self explanatory.

5. The Problem Area number includes six characters: the first two consist of the State abbreviation, i.e, Tennessee, Ohio, Kentucky, etc., and the last four comprise the Problem Area Number, which should be entered as TN0008, OH0139, KY1426, etc. For new Problem Areas, create a new and unique number (never reuse a number).

6. The Problem Area name should be the entire name assigned to the Problem Area, with no abbreviations. The purpose of the Problem Area name is to communicate a general location quickly and easily. A new and unique name should be recorded for new Problem Areas. (See Appendix B for instruction for new Problem Areas.)

7. Answer Y (yes) or N (no). Existing Problem Area "General and Locational Data" are already incorporated in the National AML Inventory data base. All new Problem Areas identified since the completion of the AML Inventory must include information requested in lines 8-19, but if the Problem Area already exists, you may skip to part B.

8. Planning Unit number: Self-explanatory, based on Planning Unit numbering system presently established in each State. For new Planning Units, see Appendix C. Note that Problem Area boundaries should not cross Planning Unit boundaries.

9. Planning Unit Name. Use the existing name identified on each State/Tribe's Planning Unit overlays. If its a new Planning Unit refer to Appendix C.

10. Record the county in which the Problem Area is located. Do not use abbreviations. Note: Problem Area boundaries must not cross county boundaries.

11. The FIPS (Federal Information Processing System) Code is a five-digit number. The first-two digits are the State code; the last-three digits are the county code. If the State code is, for example, 3, and the county is 6, it should be entered on the form as 03006.

12. Record the Congressional District number in which the Problem Area is located. Be sure this district is according to the most recent census.

13. Record the eight-digit Water Cataloging Unit (WCU) number in which the Problem Area is located. (Note: Problem Area boundaries must not cross Water Cataloging Unit boundaries.) This number can be obtained from the 1:250,000 Planning Unit map overlays; the 1:24,000 Problem Area overlays; or the U.S. Department of the Interior (USDI), U.S. Geological Survey (USGS), Hydrologic Unit Map for each State.

14. The first entry (or principal quad) should be the 1:24,000 quadrangle that contains the largest portion of the Problem Area if the Problem Area appears on more than one map. The remaining line should reflect the name(s) of other quadrangles in descending order based on the relative amount of acreage of the Problem Area. Enter the full name exactly as given on the map, lower right corner. Be sure to include the State after the quadrangle title. If the section, township, range, and appropriate subsection unit is known, record it on the second line (other quads).

15. Write the appropriate series in the blank. USGS quadrangles are most commonly produced at a scale of 1:24,000, covering 7.5 minutes of latitude and longitude. Most of the United States has been mapped in this series. However, older editions exist at a scale of 1:62,500, covering 15 minutes of latitude and longitude. Note: In Alaska, a 7.5-minute map has a scale of 1:25,000; a 15-minute map has a scale of 1:63,000. The map series indicated must conform to the map on which the Problem Area is identified.

16. Map Sector: A USGS quadrangle of either 7.5- or 15-minute series may be subdivided into nine sectors, facilitating easier descriptive location. These sectors are delineated based on the intersections of 2-minute and 30-second lines of latitude/longitude on a 1:24,000 (7.5-minute) quad, or every 5 minutes of latitude/longitude on a 1:62,500 (15-minute) quad. The names/abbreviations of each one-ninth sector are based on their position relative to the map center as follows:

NW - Northwest	NC - North Central	NE - Northeast
WC - West Central	CS - Central Sector	EC - East Central
SW - Southwest	SC - South Central	SE - Southeast

Enter the two-character sector in which the majority of the Problem Area is located.

17. In the lower right corner (southeast) of the map, just below the quadrangle name, the map's identifying coordinates are found. Enter them as given on the map.

18. Give the straight line distance in miles to the nearest tenth, i.e., 3.7, 2.4, etc.; give direction as N, SE, SSW, etc. Identify a prominent place name on the map, preferably a town or village close to the Problem Area.

19. Write the appropriate letter(s) in the blank. It is possible that all three types of coal mining activity have occurred.

B. Reasons for Update - Record the letter and if applicable, a number.

a. Annual Submission of Projects. Only new Problem Areas need to be updated.

b. Construction Grant Application. All Problem Areas must be updated. (This need is waived if the Inventory information is the same as the previous Update.) Be sure also to record an appropriate number. These subunits are mutually exclusive. Number 1 is obvious. Number 2 is the case when the problems are the same but the costs have changed. Number 3 assumes that new cost estimates will be made.

c. Completion Report. An Inventory Update must be submitted for all existing Problem Areas in completed State/Tribe reclamation projects, Federal reclamation projects, RAMP projects, and emergency projects. Check the corrrect space and record the number and letter in question 20.

d. New Problem Area. This refers to the voluntary creation of a new Problem Area.

e. If the reexamination of a Problem Area finds that problems have become more serious or new problems have developed record this reason in question 20.

f. Occasionally the resurvey of a Problem Area finds conditions the same as shown in the Inventory. However, you will need to recalculate the costs. This is because actual estimates by problem priority are being recorded in the database rather than a cost category for the entire Problem Area.

C. Description of Health, Safety, and General Welfare Problems

This section, along with (D) and (E), deals with HS&GW problems. The criteria you must weigh and use to conclude that one or more of these HS&GW features is a problem are presented in short answer form in questions 22-30. You are asked to explain in narrative form your answers in questions 31 and 32.

21. If the situation or feature fits the keyword definition found in Appendix E and meets some of the criteria outlined in questions 22-30 such that adverse affects are occurring, then you have a HS&GW problem. The Update Database is only interested in whether a type of problem is present or not within the Problem Area. Therefore, your response to question 21 is a check in the Priority 1 and/or 2 problem blank if that specific problem is present.

Many of the keyword situations will not even be considered because they're not present. Be sure, however, that you look at the last item - N (None) and check the appropriate column if there are no problems.

D. Priority 1 and 2 Criteria

22. Be sure any accident that has occurred is because of hazardous conditions at the Problem Area. Obvious examples are when an entry caves in and someone is injured or when someone drowns because of very steep banks at an AML water-filled pit. You need to consider the "attractive nuisance" concept also. Swimming holes or partying spots are examples. These types of situations attract people, and if an accident occurs, it may not have anything to do with hazardous conditions. Explain in question 31 and/or 32 whether accidents are due to hazardous conditions at the site or because the site is an attractive nuisance.

23. If the response is "yes" record the information in the narrative.

24. Be sure the corroborative evidence is about this particular Problem Area. Such statements as "All dumps attract rats and stray dogs and are hazardous" cannot be used to justify HS&GW problems at all dumps within a State/Tribe. You need to know what it is about this specific Problem Area that generates an expression of concern that an accident may occur. Include this information in the narrative.

25. If "yes" describe in the narrative the evidence that indicates the area is being visited.

26. The ease of access will need to be explained in questions 31 or 32.

27. This should be distance to where people play or live--residence--or to where people stop and congregate--roadside or other types of parks, or schools, or stores. A road is not considered the "nearest population" unless drivers can and often do pull off the road for some activity. Record the distance to the nearest tenth of a mile.

28. Public use area refers to obvious ones such as parks or recreational areas, but also includes roads and waterways where, if the problem is seen, people may stop to explore.

29. "People directly impacted" refers to people who either live on or near the problem or are exposed to hazards because they work near-by, travel near the hazard, or go to the area for some specific purpose, such as swimming, fishing, or exploring. This is sometimes difficult to determine, particularly in rural areas or if the impact is seasonal. Always tie the number of people impacted to a timeframe such as "50 per week during the summer" or "maybe six per month year around." This should be explained in the narrative on lines 31 and 32. Record zero, one, two, or three in the blank.

30. Be sure to respond to this question by recording the appropriate letter and explain in the narrative.

E. Evidence of Health, Safety, and General Welfare Problems

In this section you explain the simple answers you gave to questions 22-30. These explanations should provide the evidence you considered and that caused you to conclude, that the Health, Safety, and General Welfare problem(s) indicated in question 21 exists.

You need to be specific in these narratives. If an accident occurred what was the cause? What dangerous conditions at the AML site contributed to the accident? What did interviewees say? They need to be specific about a condition in this Problem Area. Describe the access. How do you know people are visiting the area? Are the people impacted because they live nearby or just visit the area? If possible, identify all information sources by name and a means of contact (telephone number and/or address) and in the case of reports or newspaper articles, give enough information so that the source can be easily located.

The types of evidence required for questions 31 and 32 are presented as simply as possible. The objective is to identify "adverse effects." Each State/Tribe must try to record all the information that will allow them to determine the relative seriousness of each problem. If more than one type of problem exists--for example 3 portals--explain each in the narrative.

31. Explain here the evidence that caused you to conclude that this condition could reasonably be expected to cause substantial physical harm to persons or property, and to which persons or improvements on real property are currently exposed. This evidence should meet the following criteria:

a. Documentation of the circumstances of any occurrence (from records or interviews) of injury or death to a person, or persons, or damage to property.

b. Documentation that the problem is easily accessible and is being visited.

32. Present here the evidence that caused you to conclude that this condition was adversly effecting the Public Health, Safety, and General Welfare and was thus threatening people, but was not an extreme danger situation. The evidence should meet the following criteria:

a. Documentation of the adverse effects of past coal mining that might harm people or cause damage to property and an expression of public concern about problems at the Problem Area.

b. Documentation that the area is accessible or visited.

In situations where local citizens may ignore or find it difficult to recognize the dangers of Priority 2 abandoned mine land sites, the following procedure should be used:

1. Provide a description of the problem in the narrative section of the update form and note that interviewees were not concerned with the situation. Describe efforts to obtain expression of local concern and why local residents or officials were unconcerned about the problem.

2. Write "yes" to question 23 of the update form (local residents/officials have been interviewed) and "no" to question 24 (evidence of public concern).

3. If the State or Tribal AML Program Manager agrees that the problem merits inclusion in the inventory and wants OSMRE to process it despite lack of public concern, he/she should indicate concurrence by signing at the conclusion of the narrative. For non-program States the Field Office Director would indicate concurrence by signing at the conclusion of the narrative.

(Note: Subsidence is sometimes quite difficult to identify and analyze. Be sure such problems fit the definition (Appendix E). Areas that have been undermined may eventually subside and are thus potential subsidence areas but should not be claimed as problems unless they are currently subsiding.)

F. Environmental Restoration Problems (Land and Water) Priority 3 Problems

33. Most of the types of problems you will encounter are included in this list. Definitions can be found in Appendix F. You will note that the left hand column identifies problems as they were indicated in the original AML inventory while the right hand column identifies some new conditions or features that might also cause environmental damage. Add all acreage figures, round this total to the nearest acre and record in the blank labeled "Total _____ acres."

If no Priority 3 land or water conditions exist check the blank next to N (None).

G. Evidence of Environmental Restoration Problems

34. You need to record the evidence that caused you to conclude that a Priority 3 problem exists in this Problem Area. This type of problem is concerned with the degradation of soil, water, woodlands, fish, wildlife, recreational resources, and agricultural productivity as opposed to the HS&GW of people. The cause of this degradation is usually due to an unstable condition that results in offsite types of environmental impacts. For example, such a conditon may result in erosion - either wind or water. Or the impact might be visual. The presence of erosion gullies, acid or discolored water, or readily visible dumps or equipment are examples of environmental degradation. Both of the following criteria must be met and described for a Priority 3 problem to exist:

a. Corroborative or other descriptive evidence to support the surveyor's conclusion that land, water, visual, or other environmental characteristics are being degraded.

b. A clear cause and effect relationship between past coal mining practices and the environmental damage.

Note that this section also includes water conditions that may be degrading the environment. The three main indicators of polluted water and limits of acceptability are found in Appendix G. If your State/Tribe standards differ from these, indicate what they are. Try to estimate a flow rate for acid mine drainage problems or an acreage for polluted pits or ponds.

H. Reclamation Cost

Included as Appendix H are "Guidelines for Calculating AML Reclamation Costs." These should be used for estimating reclamation costs for all priority problems identified in questions 21 and 33.

You should first identify the keyword, then the reclamation to be done per unit, the unit cost, and lastly the total reclamation cost for the problem. For example; P--blast portals to seal @ $4,000/portal--3 portals x $4,000 each = $12,000.

Many times you will encounter a feature that includes problems at different priorities. A good example of this is a 10 acre gob pile that has a two acre burning section causing a DPE HS&GW impact due to unstable slopes (a trailbike broke through and was burned). On the Update Form you would check DPE on the Priority 1 column (assume Extreme Danger) for question 21. In question 31 you would justify this problem claim and be sure to note that only two acres are involved. If you also conclude that the remaining eight acres are a Priority 3 problem you would record eight acres next to the gob keyword in question 33 and justify the claimed problem in question 34. You should add a summary statement somewhere that says "the gob pile totals 10 acres, two of which are causing a DPE problem and the other eight acres are considered a Priority 3 gob problem." This could be included in question 31, 34, 36, or 40. For question 36 you would write: DPE - significant grading, conditioning, and ground cover of two acres of burning gob @ $10,000/acre ($5,000/acre doubled due to burning) for a total of $20,000 (record this in the blank for question 35). In question 40 you would say: Gob--significant grading, conditioning, and ground cover of eight acres @ $5,000 = $40,000 and record this total in question 39.

Note a major change here. You are no longer recording a "cost category" but rather an actual estimated reclamation cost. These should be expressed as follows:

$0-	10,000 - to nearest	$ 1,000
10,000-	1,000,000 - to nearest	$10,000
1,000,000-	10,000,000 - to nearest	100,000
greater than	10,000,000 - to nearest	1,000,000

If specific problem costs exceed cost guidelines by 25 percent per unit of work there must be additional justification of the work elements to explain why costs exceed the guidelines by 25 percent.

(Note: The reclamation of a subsidence area that is causing a HS&GW problem should be directed at stabilizing the currently subsiding area. It is highly probable that a specific subsidence problem will occur from time to time within a much larger area that has been undermined. Reclamation efforts should always be aimed at addressing these individual occurrences and should not allow such occurrences to justify massive subsidence reclamation projects where only a potential problem exists.)

Mapping Requirements for New Problem Areas

The AML Inventory required transparent 7.5- or 15-minute quadrangle map overlays showing Problem Areas. These have been useful to States/Tribes for Problem Area location and assisted in the final processing of the Problem Area information. However, since Problem Area evaluations will now occur between OSMRE Field Offices and the individual State/Tribe, new overlays will not be required for new Problem Areas. See Appendix D for Update Mapping requirements.

APPENDIX

APPENDIX A
State/Tribe Validation and Field Office Oversight

In order to maximize the probability that all State/Tribe Inventory submissions are processed in a consistent manner, quality control procedures have been developed to ensure that each State's/Tribe's data are subjected to the same scope and depth of review and are treated fairly and equally. To allow this to occur, there is a requirement for:

° use of a standard Update Form
° mandatory submittal of this update Form under certain circumstances
° mandatory submittal of specified information to support priority
° and cost claims
° use of standard cost guidelines
° field review of sample of update forms

Upon receipt of each State's/Tribes's Updates by the cognizant OSMRE Field Office, the submission is reviewed in two ways. First, is the form complete and is the information correct and accurate? Pay particular attention to Section A - General and Locational Data (for new Problem Areas); check to be sure problems in the standardized data are recorded and that all problems are reclaimed; and be sure that mathematical calculations are correct. (A notation such as "OK" next to these items would be helpful to the Headquarters Review Team.) Second, and most important: Is the evidence to support the problem conclusions sufficient? Is the reclamation method reasonable? Do the cost estimates follow the cost guidelines and, if not, are significant deviations explained? Updates of Problem Areas in RAMP projects received from the Soil Conservation Service should be similarly reviewed and submitted to Headquarters as you would any State's submittal. The Field Office Director is responsible for ensuring that any issues resulting from this review are discussed with the State/Tribe. When the Field Office Director is confident that all issues are either resolved or all the facts on both sides of an unresolved dispute are fully developed, or, if there are no issues, once the correctness and adequacy of the data have been determined by the Field Office, the Update Forms are sent to OSMRE Headquarters.

A list of included Problem Areas should be prepared by the State/Tribe and attached to each group of Updates when they are conveyed to the Field Office. This list should also be attached when they are sent from the Field Office or Eastern/Western Field Operations to OSMRE Headquarters. If any additional information was obtained by the Field Office or a Problem Area was retained for some reason, a notation to this effect should be made adjacent to the specific Problem Area number. This list (with notations) will allow Field Offices, the Eastern/Western Field Operations, and Headquarters to know where each Update is in the review process at any point in time.

When it leaves the Field Office, each State/Tribe submission could consist of the following types of Updates:

A. Disputed Updates where problems were not resolved at the Field Office

B. Nondisputed Updates

1. Updated Problem Areas with HS&GW problems

a. reclamation cost greater than $500,000
b. reclamation cost less than $500,000

2. All Other Updated Problem Areas

A permanent OSMRE Headquarters review team will be formed with representation from the Field Offices and the Division of Abandoned Mine Land Reclamation. Field Office representation will be rotated with individual tenures of about one year. If Updates from a review team member's Field Office are being discussed that individual will serve only as an information source. This team will review all disputed updates, all HS&GW Problem Area Updates with estimated reclamation costs greater than $500,000, and a sample of all remaining Updates. If, during the review of this sample, the team encounters a high rate of unacceptable Updates it may choose additional Updates for review. This process will continue until the number of unacceptable Updates is minimal after which the team will select and review a sample consisting of not less than 10 percent of all updates received from each State/Tribe. The first review was held August 2, 1984, and subsequent reviews will be conducted as needed.

The Headquarters review team will use the same criteria as the Field Office in evaluating the submittals. The purpose of the additional review is to identify any inconsistencies existing between Field Offices, any omissions on submittals which Field Offices may have inadvertently overlooked, and any particularly outstanding submittals which may serve as "models" of the quality of data that should be reflected in all submittals. After the team has completed its review, all reviewed submittals found to be acceptable will be entered into the AML Inventory Update Database. Additionally, each Field Office Director will be informed of the results of the review. The decision of the review team regarding acceptance or rejection of a submittal is final. The State/Tribe may choose to correct deficiencies or areas of uncertainty in the Update Forms and resubmit them at its earliest opportunity.

The following procedure and checklist guides the Field Office and Headquarters review, and has been designed to focus attention on those items which are critical to the determination that the data on the Update Form is appropriate for inclusion in the AML Inventory.

The general procedure is to record for each Update Form any deficiencies, specific questions, or additional information needs. It is best to review all updates from a State/Tribe at one sitting so that trends can be identified. This documentation will allow the Field Office to address all data concerns during one meeting with the State/Tribe. The same procedure will be used by the Headquarters review team.

Items to be covered and questions to be asked during the review are:

I. Is the Update Form complete?

A. Have all questions been answered?

B. Is each keyword problem (Priority 1, 2, or 3) described in the narratives.

C. Are positive or other appropriate responses to questions 22-30 explained in the narratives.

D. Has a reclamation method and cost estimate been presented for all identified Priority 1, 2, and 3 problems

E. Have all keywords identified in the standardized data been included? Have any changes been explained?

II. Is sufficient evidence presented to substantiate the claimed problem?

A. Priority 1 - Extreme Danger means a condition that could reasonably be expected to cause substantial physical harm to persons or property, and to which persons or improvements on real property are currently exposed. The evidence should meet the following criteria.

1. Documentation of the circumstances of any occurrence (from records or interviews) of injury or death to a person, or persons, or damage to property.

2. Documentation that the problem is easily accessible and is being visited.

B. Priority 2 - This is a condition that is adversely effecting the Public Health, Safety, and General Welfare and is thus threatening people but is not an extreme danger. The evidence should meet the following criteria.

1. Documentation of the adverse effects of past coal mining on the Public Health, Safety, and General Welfare; and an expression of public concern about problems at the Problem Area.

2. Documentation that the area is accessible or visited.

In situations where local citizens may ignore or find it difficult to recognize the dangers of Priority 2 abandoned mine land sites, the following procedure should be used:

1. Provide a description of the problem in the narrative section of the update form and note that interviewees were not concerned with the situation. Describe efforts to obtain expression of local concern and why local residents or officials were unconcerned about the problem.

2. Write "yes" to question 23 of the update form (local residents/officials have been interviewed) and "no" to question 24 (evidence of public concern).

3. If the State or Tribal AML Program Manager agrees that the problem merits inclusion in the inventory and wants OSMRE to process it despite lack of public concern, he/she should indicate concurrence by signing at the conclusion of the narrative.

C. Priority 3 - Environmental Restoration Problems. This is a situation where past coal mining practices are causing degradation of soil, water, woodlands, fish, wildlife, recreational resources, or agricultural productivity as opposed to the well being of people. Both of the following criteria should be met and described for a Priority 3 problem to exist:

1. Corroborative or other descriptive evidence to support the surveyor's conclusion that land, water, visual, or other environmental characteristics are being degraded.

2. Describe the cause and effect relationship between past coal mining practices and the environmental damage.

III. Cost - Is the suggested reclamation and cost reasonable and correct?

A. Is enough information provided so that you can reconstruct the same total cost?

B. Have cost guidelines provided by OSMRE been used and have costs that exceed these by 25 percent been explained.

C. Is each identified keyword problem associated with a cost estimate?

D. Are the costs correctly separated by priority?

The information recorded on the Update Form for an existing Problem Area will replace any previous information. The Update does not add or deduct information to the Inventory Database, it replaces it. Therefore, each Update Form must stand on its own. It must provide all evidence necessary to justify the

claimed problem(s), and describe a reclamation method and associated costs to reclaim the problem(s). Previous information for Problem Areas may be archived but whenever a picture or listing of problems that still need reclamation is requested, the updated version for each Problem Area will be used.

Field Offices are required to field review all priority 1 and 2 problem sites that have an estimated reclamation cost greater than $500,000 and, to field review a 5 percent random sample of all other updates prior to submission to Headquarters.

APPENDIX B

Problem Areas[1]

Operational Definition

A Problem Area is a subunit of the Planning Unit and contains one or more AML problems.

Since Problem Areas consist of problem mined sites (or AML impacted areas) together with immediately adjacent impacted land, the Problem Areas in a Planning Unit will seldom cover all the area in a Planning Unit. The boundaries of Problem Areas are determined by the State or its contractor or the Eastern/Western Field Operations (for nonprimacy States/Tribes). If a new problem is identified which is not in an existing Problem Area but is immediately adjacent to one it will be more convenient to adjust the boundary of the existing Problem Area to include the new problem. If this is done be sure to explain the map revision as you prepare map updates (Appendix D). However, if a new Problem Area needs to be created the data collector should consider the following criteria in determining its boundaries:

1. Problem Areas should be large enough to contain significant impact but not so large that the impact could not be noticeably reduced with one project. The area can contain any combination of health, safety, general welfare, and restoration problems.

2. In the East, a Problem Area should be based on physiographic and management considerations. For instance, a river bottom and floodplain might constitute the Problem Area for a sedimentation problem. The problem source of the sediment located upstream would constitute a second Problem Area, for example, a steep-sloped ridge containing a mined area. These areas are linked on the Problem Area data forms by means of a cross reference entry. The proposed Problem Area approach allows off-site impacts such as flooding to be recorded and then linked to their sources during the identification of possible projects.

3. In the West, Problem Areas should be based primarily on the management considerations of AML problems. The extent of the problem (subsidence, for example) could form the limits of the Problem Area.

4. Problem Areas should be confined to a single county. Separate Problem Areas will be created whenever the possibility occurs of an AML problem spanning county lines.

5. Where population impacts are associated with an AML problem, the Problem Area boundary should be drawn to include those people experiencing direct impact because of their proximity to the source of the problem for some significant amount of time. The homes or work place of infrequent or unlikely visitors to the problem site should not be included in the Problem Area. For example, the Problem Area with a vertical opening at the edge of a town should not include the whole town, but only that portion of homes whose children are likely to play in the vicinity of the opening.

[1]These are similar to definitions developed in the Phase II data collection effort and presented in the AML Inventory Procedures Handbook, page 61.

APPENDIX C
Procedure for Identifying Planning Units

Each State in the Nation has been divided into Water Cataloging Units (WCU) by the Water Resources Council. These appear on the State's Hydrologic Unit Map, which was prepared by the U.S. Department of the Interior, U.S. Geological Survey, in cooperation with the U.S. Water Resources Council.

In preparation for conducting the AML Inventory, each State/Tribe or their contractor was required to prepare 1:250,000 map overlays that identified WCUs and delineated Planning Units.

If the Problem Area being updated was identified during this Inventory, then the Planning Unit name and number and the WCU number can be obtained from these overlays. The same information can be found on the 1:24,000 quadrangle overlays that were also required. The originals should be located at the responsible OSMRE Field Office or State department, or can be seen on the microfiche. When a new Problem Area is identified, its Planning Unit and WCU location can be obtained from one of the above sources.

Since Planning Units were designated for all known areas where coal reserves occurred it is highly probable that new Problem Areas will be located in one of these existing Planning Units. If not, it should be immediately adjacent to one. The simpliest way to take care of this situation is to adjust the Planning Unit boundary to include this new Problem Area. Be sure the adjustment does not cross a WCU line and is explained on the revised map products (Appendix D).

You should seldom or never need to create a Planning Unit, but if you should, use the following method.

1. First note how other Planning Units in the State/Tribe were determined and try to use the same methodology. In general, Planning Units east of the Mississippi River correspond to watersheds. Planning Units in the West were defined in a number of ways, including quadrangles, grazing districts (Navajo Indians), townships, counties, or entire Water Cataloging Units.

2. In general, Planning Units are subdivisions of WCUs, but in areas of low AML impact the entire WCU may be designated a Planning Unit. A Planning Unit should meet the following criteria:

   a. A Planning Unit should be underlain by coal reserves and usually will include areas disturbed by coal mining.

   b. A Planning Unit must not have such a large number or disparity of problems that one major project does not appear to contribute to the reduction of AML impact.

   c. In States with low AML impact densities or with irregularly scattered areas of high impact, Planning Units must be defined using areas comparable in problem magnitude rather than areas comparable in size.

3. Since the coal region and surrounding areas of all States/Tribes were divided into Planning Units, the need for a new Planning Unit will usually involve an area of very low coal mining activity. Therefore, identify the WCU in which the Problem Area is located and designate the entire WCU or any remaining undesignated portion of the WCU as the new Planning Unit. You will need to give it a unique name and number.

4. The Planning Unit (and Problem Area) concept is a convenient method of subdividing the State or tribal lands into convenient and manageable units. As the AML Reclamation Program continues, some States will begin addressing noncoal HS&GW Problems. This same PU/PA system could be used to locate these other problems.

APPENDIX D
Mapping Requirements

The AML Inventory required two map deliverables--Planning Unit overlays at the scale of 1:250,000, and Problem Area overlays at the scale at 1:24,000 (if 1:24,000 scale maps are not available, then 1:25,000 or 1:62,500 could be substituted). Each State/Tribe AML program and each OSMRE Field Office has a set of these maps and/or overlays. They are also included in the AML Inventory microfiche. As updating occurs, it is important that these map products also be updated.

Planning Units

Each State/Tribe was provided a complete set of 1:250,000 topographic maps and a set of computer-generated overlays on which Water Cataloging Units (WCU) were outlined. Those responsible for conducting the inventory were required to develop mylar Planning Unit overlays that delineated Planning Units according to procedures outlined in the Cooperative Agreement. In some cases all State/ Tribal lands were divided into Planning Units, and in others only the coal regions were divided.

Since the Planning Unit designation effort concentrated on all possible areas within a State where coal mining might have occurred, it is highly unlikely that new Planning Units will need to be created. However, if they are needed, use the following very simple procedures.

1. Note the Problem Area location on the 1:250,000 topographic map as accurately as possible.

2. Then identify the WCU within which the Problem Area is located.

3. This entire WCU will become the new Planning Unit, i.e., the WCU and the Planning Unit will be one and the same. If a Planning Unit already occurs within the WCU then the remaining undesignated portion of the WCU will become the new Planning Unit.

4. If the Problem Area is immediately adjacent to an existing Planning Unit merely adjust the Planning Unit boundary to include the new Problem Area. Be sure the adjustment does not cross a WCU boundary.

5. Give this new Planning Unit a unique name and number, and be sure to note somewhere on the Update Form that it is a new Planning Unit.

6. Duplicate the portion of the map with the new Planning Unit. If the Planning Unit is large, you may need to construct a composite. This copy will be used by the OSMRE Field Office to transfer the location to their overlays, so be sure good reference points are noted on the copy.

Problem Areas

It is the intent of the Update to retain the identity of all Phase II Problem Areas and any new Problem Areas located by a State/Tribe and submitted to OSMRE. This is essential in case new problems occur at the Problem Areas or an inquiry about a Problem Area's status is received.

Early experience with State/Tribe AML programs indicates that indeed new problems are continuously being identified and the need to create new Problem Areas is real. The procedure for delineating the boundaries of these new Problem Areas is found in Appendix B.

The procedure for updating the map products for these new Problem Areas follows.

1. Once the new Problem Area boundary is determined by the State, it should be outlined in pencil with dashed lines and named and numbered on the State's/Tribe's 1:24,000 quadrangle map. If possible, the general location of health, safety, and general welfare (HS&GW) problems within the Problem Area should be indicated by symbols or keyword abbreviations.

2. The portion of the map showing the Problem Area should then be duplicated on a copying machine. If the Problem Area is large, you may need to make a composite. This copy will be used to transfer the Problem Area location to the OSMRE Field Office map, so be sure that a good reference point is also on the copy for orientation.

3. Copies of topographic maps are sometimes difficult to read. You should highlight on the copy: the Problem Area boundary, the Problem Area name and number, and the location of HS&GW problems.

4. Be sure to write the complete quadrangle name and State on this copy and attach it to the Update Form.

It is assumed that the map identification of existing Problem Areas will rarely change. If, however, a State/Tribe decides to revise the boundaries of existing Problem Areas, then the same procedure as outlined in the four steps above is used with one very important exception. Use the same Problem Area name and number. Be sure to indicate on the copy attached to the Update Form that the map revisions are to an existing Problem Area.

Other Comments

First, these map products are meant to be used, not framed and hung on the wall. That includes overlays, original topographic maps, and any copies. Feel free to write on them, make notes, add problems, etc. Second, arrangements have not yet been made to update the microfilm record of these map products or the Update Form. When this is known, instructions will be provided in an appendix to be attached to this manual.

APPENDIX E

HS&GW Keyword Definitions

CS Recurrent Flooding or Ground Saturation
Flooding caused by AML-related sedimentation or degraded water retention characteristics which affects populated areas, property, or improved lands.

*Flooding means flooding has occurred within the past several years and that there is nothing to indicate that flooding will not again occur in the next several years.

* This includes ground saturation or problems caused by materials moved and deposited by the action of mine-related flows.

*The CS Keyword cannot be included if the problem description does not indicate that flooding or ground saturation has already occurred.

Dangerous Pile or Embankment

DPE Any AML-related refuse pile or embankment that is considered a health or safety problem because of unstable slopes or windblown particulate matter, and is located within close proximity to a populated area, public road, or other public use area.

*The instability of the slopes of a DPE is considered in view of danger to people in contact with the slopes.

DH Dangerous Highwall

Any AML-related, unprotected, and dangerous highwall located in close proximity to a populated area, public road, or other public use area.

Danger is interpreted to mean danger to people.

*The State law on highway slopes left after mining should be considered in assessing a slope's acceptability.

DI Dangerous Impoundment

Any AML-related water catchment basin, naturally formed or artificially built, which is dammed or excavated for the retention of water, sediment, or waste, and poses a threat to the safety of life or property. Such an impoundment must be currently leaking and/or structurally unsound or subject to dangerous transient waterflow conditions and be located upstream of manmade structures or populated areas.

*The description of a DI must give evidence of a weak, unstable or otherwise inadequate impounding structure.

Appendix E (Continued).

DS Dangerous Slide

Any AML-related slide area endangering populated or improved areas or one that could cause the impoundment of water or the breach of an existing impoundment.

*Refers to the movement of material of its own accord due to its instability.

*The impoundment of water or breach of an existing impoundment must have the potential for causing a flooding impact.

GHE Hazardous or Explosive Gases

AML-related venting of hazardous gases not related to combustion, or venting of explosive gases.

GUB Gases from Underground Burning

Any AML-related continuing smoke, haze, heat, or venting of hazardous gases from underground coal combustion.

HEF Hazardous Equipment or Facilities

AML-related hazardous equipment or facilities located within close proximity to populated areas, along public roads, or other public use areas.

HWB Hazardous Recreational Water Body

Any nonpolluted, impounded water, regardless of depth or surface area, that is considered an attractive nuisance and is located within close proximity to a populated area, public road, or other public use area.

*The hazard must result from some mine-related feature(s) such as steep or unstable banks, hidden underwater ledges, or rocks or debris on the bottom.

*The fact that a pond is present is not sufficient evidence of a hazard.

*Problems may be related to the presence of the pond but not fit into the HWB category, for example, traffic problems due to swimmers parking near the pond (a nonkeyword impact).

IRW Industrial or Residential Waste

Unauthorized and dangerous use of AML-impacted areas for residential or industrial waste disposal.

*The concept of danger includes health hazards and hazards related to burning of the wastes.

Appendix E (Continued).

P Portal

Any AML-related surface entrance to a drift, tunnel, adit, or entry which is nearly level; is not sealed; and is located within close proximity to a populated area, public road, or other public use area.

*Only safety hazards are included. Impact caused by water coming from portals is usually covered by the CS keyword.

PWAI Polluted Water: Agricultural/Industrial

Any surface or subsurface water used for agricultural or industrial purpose which does not meet standards (especially those for suspended solids, acid or alkaline conditions, heavy metals concentrations, or radioactivity) because of AML-related impact.

*Water must currently be used.

*Current test results demonstrating pollution are recommended.

PWHC Polluted Water: Human Consumption

Any surface or subsurface water used for human consumption or recreational waters used for swimming whose quality does not meet standards (especially those for suspended solids, acid or alkaline conditions, heavy metals concentrations, or radioactivity) because of AML-related impact.

*Water must currently be used.

*Current test results demonstrating pollution are recommended.

S Subsidence-Prone Area

Any surface expression of AML-related subsidence such as tension cracks, potholes, troughs, or caving whose impact affects populated areas or affects the utilization of improvements.

*Only economic impacts are included. Safety impacts fall in the VO category.

*Subsidence correctly refers to caving into underground mining-related voids. Subsidence must be active.

SB Surface Burning
Any AML-related continuing incidence of surface burning resulting in smoke, haze, heat, or venting of hazardous gases.

*Burning must currently be occurring or be demonstrated to occur on a regular basis.

Appendix E (Continued).

*Burning in mine dumps, even if occurring beneath the surface, is surface burning.

VO Vertical Opening

Any AML-related vertical or steeply inclined excavation or surface opening, regardless of proximity to populated areas, that is large enough for a child to fall through and be injured, and is not adequately sealed or barricaded.

NOTE: Interpret "populated area" to be one where anyone lives witnin 1 mile of the problem. A site qualifies as a "public use area" if any evidence is given of visitation on or adjacent to the site.

APPENDIX F
Lands and Water Keyword Definitions

BE - Bench, Solid Bench, Fill Bench	- A ledge that forms a single level of mining operation along which mineral or waste materials are excavated. A solid bench is that portion of a bench formed on solid, unexcavated material. - A fill bench is that porton of a bench usually consisting of unconsolidated spoil material extending outward from the solid bench.
DP - Industrial or Residential Waste Dump	- An area used to dispose of any kind of industrial or residential waste not related to coal mining or processing.
EF - Equipment and Facilities	- Any equipment or buildings used to mine, process or transport coal.
GO - Gob	- The refuse or waste removed from an underground mine. - Waste coal, rock pyrites, slate or other unmerchantable material which is separated from coal in the cleaning process.
H - Highwall	- The face of exposed over burden or the face or bank on the uphill side of a contour strip mine excavation. - The vertical wall consisting of the deposit being mined and the overlying rock and soil strata of the mining site.
HR - Haul Road	- A road built to carry loaded trucks from mine heads. - Road from pit to loading dock, tipple ramp or preparation plant, used for transporting mined material by truck.
MO - Mine Opening	- Any surface entrance or opening related to the underground excavation of coal.
O - Other	- An area causing an environmental impact that does not fit one of the above definitions.
PI - Pit, Open Pit, Strip Pit	- The last uncovered cut adjacent to the highwall. - In surface mining the working may be known as a strip pit. - Mine workings or excavations open to the surface are also termed pits.
SA - Spoil, Spoil Bank	- The overburden material removed in gaining access to a coal seam.

SL - Slurry - Fine coal particles concentrated in water. Solids must be separated from the water in order to have clear effluent for reuse or discharge.

SP - Slump - Any surface expression resulting from the caving in of underground mine voids.

WA - Water - Water leaving the AML Problem Area and causing environmental impacts because of its pH, sediment load, or other pollutants or because of its effect on other lands due to poor drainage conditions (see Appendix G for further discussion)

APPENDIX G
Polluted Water

There are three indicators for the common types of pollution associated with Abandoned Mine Land problems. Certain States may experience unusual types of pollution which are not characterized by either pH, turbidity, or iron concentration. In these cases, an indicator or indicators for these other pollutants should be added.

Testing consists of onsite measurements of the three paramenters discussed below using water "grab" samples.* A sample failing any of the tests is considered polluted. This approach and the accuracy of the techniques described below produce a crude indication of water pollution and more precise monitoring will be necessary when site-specific studies are done for project implementation.

Initial water samples should be taken at the outflow point of the Problem Area with subsequent samples taken upstream or at suspected problem sites. This is recorded in the form of field notes and on field maps for later identification of problems as required. The following specifications describe the tests to be performed.

Paramenters	Equipment	Polluted if
Degree of Acidity	Electronic pH meter	less than 5 or greater than 9
Suspended Solids	Turbidimeter	greater than 70.0 mg/liter solids
Iron	Iron Test Kit	greater than 7.0 mg/liter
Other identified local pollutants		

*An excellent example of a simple procedure to gather grab samples is found in: The Strip Mine Handbook, Environmental Policy Institute, 317 Pennsylvania Avenue, SE., Washington, D.C. 20003, 1978.

Appendix H
GUIDELINES FOR ESTIMATING AML RECLAMATION COSTS

(Subject to change as Reclamation Project cost experience increases)

1. Revegetation of spoils, bench, pits (when filling is not required), gob material, and haul roads.

   a. Spot plantings and a few scattered silt control structures, no grading: $ 500/acre

   b. Conditioning and ground cover, no grading.

      On less than 10 acres: $1,500/acre
      Over 10 acres: $1,000/acre

   c. Smoothing with rubber-tired equipment (some grading), conditioning, ground cover.

      On less than 10 acres: $2,000/acre
      Over 10 acres: $1,500/acre

   d. Significant grading, conditioning, ground cover.

      On less than 10 acres: $5,000/acre
      Over 10 acres: $3,500/acre

   e. For toxic soil, double cost/acre for the affected acreage.

   f. For burning acres (surface burning), double the cost/acre for the affected acreage.

   g. For extremely large piles of mine wastes (generally over 40 feet high or with an average depth of 15 feet or more or containing more than 25,000 cubic yards of material/acre) where removal of material is likely to be required in addition to grading, it may be appropriate to calculate cost according to the volume of material involved rather than by the acreage disturbed.

      Cost: $4/cubic yard

2. Slurry Areas

   a. Under 10 acres: $15,000/acre
   b. Over 10 acres: $10,000/acre

3. Highwalls

   First, compute the Height, Length, Product (HLP) by multiplying the length of highwall in feet times the height of the highwall in feet.

   a. HLP less than 4,000: $10/HLP

   b. HLP 5,001-500,000: $ 5/HLP

   c. HLP over 500,000 $ 2/HLP

When extremely long or tall highwalls are considered to be safety problems, the cost of reducing the slope or backfilling may be prohibitively high. If it seems that a fence or guard rail will adequately address the safety concerns, then that cost should be included.

4. Slides

These are generally in the $100,000 to $500,000 range when located in areas where major improvements exist. For slides that require only correction of drainage patterns or some grading, estimate costs on the amount of acreage to be disturbed and the type of work needed in order to stabilize the slide.

5. Water problems (costs vary considerably with volume, plus water quality and treatment method chosen)

a. Water treatment

Treatment of small flows of less than 15 gpm (often limestone drains, air seals, aeration wiers):	$1-10,000
Treatment of flows from about 15-100 gpm:	$10K-$ 100K
Treatment of flows from about 100-500 gpm:	$100K-$ 500K
Treatment of flows over 500 gpm:	Over 500K

b. Stream cleaning: $10K-50K/mile

c. Treating/draining ponds: $1,600/acre foot
$5,000/million gallons

d. Backfilling pits and draining and backfilling ponds or pits: $8K/Ac/10' depth

6. Dismantling large steel or reinforced concrete structures: $50,000

NOTE: Discretion must be used when estimating costs for other structures. Base estimates on the size, condition, accessibility, and type of construction material (wood, sheet metal, etc.) of the structure to be dismantled.

7. Portals and Shafts

a. Sealing portals or shafts by blasting: $ 2,000/opening

b. Sealing portals or shafts by methods other than blasting (economies of scale assume openings are in same general area).

1- 2 openings:	$5,000 each
3- 5 openings:	$4,000 each
6-10 openings:	$3,000 each
more than 10 openings	$2,000 each

8. Large Underground Mine Fires:
Some of the variables affecting the actual cost of addressing a particular fire are:

* The depth of the fire
* The thickness of the seam involved
* The acreage involved
* The ease of site access
* The density of improvements overlying the fire
* The nature of nearby mine pools
* The nature of original mining practices
* The underlying geology

Complete extinguishment may be attempted by one of several methods or an attempt may be made to contain the fire and allow it to burn out. Methods and costs involved in seam fire extinguishment or containment are very site-specific and there is no way to make reliable cost projections at least until engineering studies have been done. The first step is usually an exploratory drilling project.

Before an actual project is designed, the possibility of protecting threatened improvements by selective containment procedures rather than complete extinguishment may have to be considered.

It seems likely that complete extinguishment of at least some of the fires would not be accomplished during the course of the AML Program.

9. Large Subsidence Prone Areas Impacting Property:

Flushing to fill the underground voids is a common remedial action but it is recognized that site-specific considerations might make the use of other techniques more appropriate.

Some of the variables affecting the actual cost of reclamation work are:

* Total acreage involved
* Number of seams mined
* Depth and thickness of seams mined
* Extend of voids
* Extent of mining supports
* Ability to maneuver and position equipment within the impacted area
* Attitude of all landowners involved.

In addition, before actual projects are designed and funds allocated for large subsidence prone areas, two factors may have to be taken into consideration. One of these is the possibility of addressing individual subsidence occurrences within the large subsidence prone area rather than addressing the entire area. The other is how the cost of the proposed abatement compares with the value of the threatened improvements.

Some cost estimates are based on a rate of $100,000/acre and are meant to serve as an indication of what the approximate magniture of the cost would be if complete stabilization is attempted.

In cases where it is clear that the magnitude of the estimated cost would exceed the estimated value of the threatened improvements, the cost should be truncated at the estimated value of the improvements. This assumes that the improvements would be purchased rather than protected at a greater cost.

Some large subsidence problems might not be addressed in full during the course of the AML Program.

A. The following are very general estimates that may be used.

$1-10K	Holes that have opened up may be filled. No flushing projects.
$10-100K	Very small projects involving 1-2 homes or about 1 acre and no major utility lines.
$100-500K	Small projects over .25 acre with major utility lines involved.
Over-500K	Projects over eight acres.

10. Large Flows of Polluted Mine Drainage:
Some of the variables affecting the actual cost of treatment are:

* Seasonal flow rate variability
* Variability of the pH and iron content (or other pollutants) of the drainage
* The number of drainage sources
* The impact on any receiving streams
* The interrelationships between drainage in the Problem Area and that from other Problem Areas.

Water treatment methods are very site-specific with such options as air seals, aeration weirs, holding ponds, limestone drains, recharge control and treatment plants being among the possibilities to be considered. For purposes of formulating update cost estimates, it is assumed that treatment plants would be required for the larger flows although it is recognized that this means of addressing a particular problem might not prove to be the most appropriate after required engineering studies have been done.

It is also recognized that use of a water treatment facility does not provide true reclamation but only abatement of the problem for as long as plant maintenance is continued. This is an example of a problem not being addressed in full during the course of the AML Program.
In order to provide the required cost estimates, some very broad assumptions should be made:

* The flow rate is the average rate over a year's time
* A treatment facility will be needed
* A lime with sludge removal method will be used
* Treatment costs for moderate acidity will apply in all cases

The Appalachian Regional Commission's 1969 publication, Acid Mine Drainage in Appalachia, is used as a resource. A table on page 60 of the book gives estimated costs for water treatment associated with water treatment plants of three sizes. The costs include plant amortization and are assumed to have doubled since 1969 because of inflation. The following rough guidelines are based on the figures in the table and should be used to estimate current treatment costs.

Total flow of polluted mine drainage	Cost of treatment/1000 gals./day in dollars
500-600 gpm	.74
600-700 gpm	.70
700-1200 gpm	.66
1200-2400 gpm	.64
2400-3600 gpm	.62
3600-5500 gpm	.60
5500-9000 gpm	.58
9000-15,000 gpm	.56
15,000 or more gpm	.54

Two cost estimates are calculated for treatment of large flows. One is the cost/year for water treatment (including plant amortization) and the other, the estimated Inventory restoration cost. This latter figure is 10 times the yearly figure and is intended to be a rough estimate of the cost of abatement for the duration of the AML Program.

The following calculations may be performed in each case using the gpm figures:

gpm x 60 mins./hr. = 24 hrs./day = gpd

$\frac{\text{gpd}}{1000 \text{ gals.}}$ x dollar cost/1000 gals./day (from above table) = cost/day

cost/day x 365 days/year = cost/year = anticipated cost of abatement/year

Cost/year x 10 = estimated Inventory restoration cost

Water problems involving wells and septic systems will require more individual consideration. Providing new, cased wells is one option available to address polluted domestic water supplies.

Another might be installing new waterlines. Although these options do not sound like reclamation they fall in the same category as building guardrails along highwalls.